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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.		
10/679,367	10/07/2003	Kenichi Yokoyama	5988-056-27	4296		
23552 MERCHANT &	7590 02/23/200 & GOULD PC	EXAMINER				
P.O. BOX 2903	}	LEE, SIN J				
MINNEAPOLI	S, MN 55402-0903		ART UNIT	PAPER NUMBER		
			1752			
SHORTENED STATUTOR	Y PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE			
3 MO	NTHS .	02/23/2007	PAPER			

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

			Application N	lo.	Applicant(s)			
Office Action Summary		10/679,367		YOKOYAMA ET AL.				
		Examiner		Art Unit				
			Sin J. Lee		1752			
Period fo	The MAILING DATE of this commun or Reply	nication app	ears on the co	ver sheet with the c	orrespondence ad	ddress		
WHIC - Exte after - If NC - Failu Any	ORTENED STATUTORY PERIOD FOR CHEVER IS LONGER, FROM THE MINISTRANCE IN LONGER, FROM THE MINISTRANCE IN LONGER, FROM THE MINISTRANCE IN LONGER IN L	MAILING DA s of 37 CFR 1.13 munication. tatutory period w y will, by statute,	ATE OF THIS ( 36(a). In no event, h vill apply and will exp cause the application	COMMUNICATION owever, may a reply be timing ire SIX (6) MONTHS from to become ABANDONE	I. sely filed the mailing date of this of (35 U.S.C. § 133).			
Status								
1)⊠	Responsive to communication(s) file	ed on 13 No	ovember 2006					
2a)□	· · · · · · · · · · · · · · · · · · ·		action is non-					
3)□	Since this application is in condition	•			secution as to the	e merits is		
•	closed in accordance with the pract	ice under <i>E</i>	x parte Quayle	e, 1935 C.D. 11, 45	3 O.G. 213.			
Disposit	ion of Claims							
4)⊠	Claim(s) <u>2-16,18 and 19</u> is/are pend	ding in the a	application.					
-	4a) Of the above claim(s) is/are withdrawn from consideration.							
	Claim(s) 7-11 is/are allowed.				·			
6)⊠	☑ Claim(s) <u>2,3,5,12-14,16,18 and 19</u> is/are rejected.							
7)🖂	Claim(s) 4,6 and 15 is/are objected	to.						
8)[	Claim(s) are subject to restri	ction and/or	r election requ	rement.				
Applicat	ion Papers							
9)[]	The specification is objected to by the	ne Examiner	г.		•			
•	The drawing(s) filed on <u>28 June 200</u>			r b) objected to	by the Examiner.			
,	Applicant may not request that any obje		•		-	·		
	Replacement drawing sheet(s) including	g the correcti	ion is required if	the drawing(s) is obj	ected to. See 37 C	FR 1.121(d).		
11)[	The oath or declaration is objected t	o by the Ex	aminer. Note t	he attached Office	Action or form P	TO-152.		
Priority ι	ınder 35 U.S.C. § 119							
	Acknowledgment is made of a claim ☐ All b)☐ Some * c)⊠ None of:				-(d) or (f).			
	1. Certified copies of the priority documents have been received.							
	2. Certified copies of the priority documents have been received in Application No							
	3. Copies of the certified copies of the priority documents have been received in this National Stage							
application from the International Bureau (PCT Rule 17.2(a)).  * See the attached detailed Office action for a list of the certified copies not received.								
	and a distance detailed office delice	or to a not	o. are corumed	22,00 1.01 1000110				
Attachmen	t(s)							
1) Notice of References Cited (PTO-892)  4) Interview Summary (PTO-413)								
2) 🔲 Notic	e of Draftsperson's Patent Drawing Review (		Paper No(s)/Mail Da	ite				
3) Information Disclosure Statement(s) (PTO/SB/08)  Paper No(s)/Mail Date  5) Notice of Informal Patent Application 6) Other:								
•	·		´ •					

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## **DETAILED ACTION**

1. In view of the amendment of November 13, 2006, previous 102(b) rejection on claim 13 over Nakano et al (JP'923), previous 102(b) rejection on claims 7-9 over Watabe et al (JP'520), previous 103(a) rejection on claims 3-5, 7-9, 14-16 and 18 over Yasunami et al'287, previous 103(a) rejection on claims 16 and 6 over Iwasawa et al'769 in view of Yasunami et al'287 and previous 103(a) rejection on claims 19 and 2 over Adegawa et al'916 are hereby withdrawn.

2. Due to new grounds of rejections, the following rejections are made non-final with the Examiner's sincere apology.

## Claim Rejections - 35 USC § 103

- 3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
- 4. Claims 3, 5, 14, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura et al (US 2003/0219680 A1).

Nishimura teaches a photoresist composition containing (A) an alkali-insoluble resin which becomes alkali soluble by the action of an acid and (B) a photoacid generator (see [0016]-[0019]). Nishimura teaches that his resin (A) can contain a recurring unit of formula (II) or (III) as shown in [0086];

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$$(II)$$

$$R^{4}$$

$$CCCH_{2}$$

$$OCC$$

$$R^{5}$$

$$R^{5}$$

$$R^{5}$$

$$R^{5}$$

$$R^{5}$$

As one of four kinds of examples of for R<sup>3</sup>, Nishimura teaches (see [0088]) the following formula

, and as one of preferred examples for  $-C(R^7)_3$ , Nishimura teaches t-butyl group (see [0103]-[0104]). Based on Nishimura's teaching, it would have been obvious to one skilled in the art to include the repeating unit of formula (II), in which  $R^3$  is t-butoxycarbonyl group, into Nishimura's resin (A) with a reasonable expectation of obtaining a resist composition having high transmittance of radiations and exhibiting high sensitivity, resolution, pattern shape, dry etching resistance and line width stability. Nishimura also teaches the use of an onium salt (see [0954]).

Nishimura teaches the use of a nitrogen-containing organic compound such as nitrogen-containing heterocyclic compound as an acid diffusion controller (see [1009],

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[1010], [1014] and [1020]). As one of examples for such compound, Nishimura teaches 1-benzyl-2-methylimidazole (which teaches present compound of formula (1) of claims 16 and 18 – present R<sup>1</sup> and R<sup>3</sup> being H atoms, R<sup>2</sup> being a phenyl group and present R<sup>4</sup> being a methyl group). Based on Nishimura's teaching, it would have been obvious to one skilled in the art to use 1-benzyl-2-methylimidazole as Nishimura's acid diffusion controller with a reasonable expectation of improving storage stability and resolution of the resulting resist composition. Therefore, Nishimura's teaching renders obvious present inventions of claims 16, 5, 18, 3 and 14.

5. Claims 19 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura et al (US 2003/0219680 A1) in view of Kodama et al (5,891,603).

Although Nishimura teaches the use of an alkali-insoluble resin which becomes alkali soluble by the action of an acid and a photoacid generator, such two-component system is well known in the art to be equivalent to three-component system, which contains an alkali-soluble resin, a photoacid generator and a dissolution inhibitor, as evidenced by Kodama, col.2, lines 48-64. Because of this art-recognized equivalency, it would have been obvious to one skilled in the art to use an alkali-soluble resin having (meth)acrylic acid repeating unit together with a dissolution inhibitor in Nishimura's resist composition. Therefore, Nishimura in view of Kodama would render obvious present inventions of claims 19 and 2.

6. Claims 3, 5, 12-14, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamabuchi et al (US 2003/0148211 A1).

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Kamabuchi teaches a resist composition containing Resin A1, a photoacid generator (sulfonium salt) and a quencher (see [0106] and [0119]-[0123]).

As one of examples for the quencher, Kamabuchi teaches (see [0073]-[0075]) the following compound

in which R<sup>11</sup> can be an alkyl group of 1-6 carbon atoms and R<sup>13</sup> can be an alkyl group of 1-6 carbon atoms. Based on Kamabuchi's teaching, it would have been obvious to one skilled in the art to use the compound shown above in which R<sup>11</sup> and R<sup>13</sup> are alkyl group of 6 carbon atoms as a quencher in Kamabuchi's composition with a reasonable expectation of diminishing performance deterioration caused by inactivation of acid which occurs due to post exposure delay. Such compound teaches present compound of formula (1) of claims 12, 13, 16 and 18 (present R<sup>1</sup> and R<sup>3</sup> being H atoms, R<sup>2</sup> being pentyl group, R<sup>4</sup> being hexyl group and present R<sup>5</sup> and R<sup>6</sup> being alkenyl groups which are bonded together to form a ring). Therefore, Kamabuchi's teaching renders obvious present inventions of claims 12, 13, 16, 5, 18, 3 and 14.

7. Claims 19 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamabuchi et al (US 2003/0148211 A1) in view of Kodama et al (5,891,603).

Although Kamabuchi teaches the use of an alkali-insoluble resin which becomes alkali soluble by the action of an acid and a photoacid generator, such two-component system is well known in the art to be equivalent to three-component system, which

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contains an alkali-soluble resin, a photoacid generator and a dissolution inhibitor, as evidenced by Kodama, col.2, lines 48-64. Because of this art-recognized equivalency, it would have been obvious to one skilled in the art to use an alkali-soluble resin having (meth)acrylic acid repeating unit together with a dissolution inhibitor in Kamabuchi's resist composition. Therefore, Kamabuchi in view of Kodama would render obvious present inventions of claims 19 and 2.

## Allowable Subject Matter

- 8. Claims 4, 6 and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. None of the cited prior arts teaches or suggests present resin of claim 4 having a recurring unit of formula (10) or present resin of claim 6.
- 9. Claims 7-11 are allowed. None of the cited prior arts teaches or suggests present negative type composition of claim 7 or present component (A) of claim 10.
- 10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333. The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A. A.L.

S. Lee

February 16, 2007

SIN LEE PRIMARY EXAMINER